

RF-EXPOSURE REPORT**FCC 47 CFR Part 2.1091
ISED RSS-102****RF-Exposure evaluation of mobile equipment****Report Reference No.**: G0M-1806-7459-TFC091ME-V02**Testing Laboratory**: Eurofins Product Service GmbHAddress: Storkower Str. 38c
15526 Reichenwalde
Germany**Accreditation**:DAkkS - Registration number : D-PL-12092-01-03 (ISED)
ISED Testing Laboratory site: 3470A-2
DAkkS - Registration number : D-PL-12092-01-04 (FCC)
FCC Filed Test Laboratory, Reg.-No.: 96970**Applicant's name**: W.O.M. WORLD OF MEDICINE GmbHAddress: Salzufer 8
10587 Berlin
GERMANY**Test specification:**Standard: FCC 47 CFR 2.1091
FCC KDB 447498 D01 v06:2015-10-23
ISED RSS-102, Issue 5:2015-03**Equipment under test (EUT):**

Product description	The device PP120 is a pump providing irrigation and suction function for laparoscopy	
Model No.	PP120	
Additional Model(s)	None	
Brand Name(s)	LAP-Pump	
Hardware version	04/15	
Firmware / Software version	01.01	
Contains	FCC-ID: 2AS5K-TSHW42	IC: 25004-TSHW42A
Test result	Passed	

Test Report No.: G0M-1806-7459-TFC091ME-V02

Eurofins Product Service GmbH
Storkower Str. 38c, D-15526 Reichenwalde, Germany

Possible test case verdicts:

- neither assessed nor tested: N/N
- required by standard but not appl. to test object.....: N/A
- required by standard but not tested.....: N/T
- not required by standard for the test object: N/R
- test object does meet the requirement.....: P (Pass)
- test object does not meet the requirement.....: F (Fail)

Testing:

Test Lab Temperature: 20 – 23 °C

Test Lab Humidity: 32 – 38 %

Date of receipt of test item: 2019-03-21

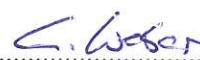
Date (s) of assessment: 2019-05-09

Compiled by: Burkhardt Pudell

Assessed by (+ signature): Burkhard Pudell
(Responsible for Assessment)



Approved by (+ signature): Christian Weber
(Deputy Head of Lab)



Date of issue: 2019-08-22

Total number of pages: 14

General remarks:

The test results presented in this report relate only to the object tested.

The results contained in this report reflect the results for this particular model and serial number. It is the responsibility of the manufacturer to ensure that all production models meet the intent of the requirements detailed within this report.

This report shall not be reproduced, except in full, without the written approval of the issuing testing laboratory.

Additional comments:

Version History

Version	Issue Date	Remarks	Revised by
01	2019-05-09	Initial Release	
02	2019-08-22	Replaced document GOM-1806-7459-TFC091ME-V01 Replaced by GOM-1806-7459-TFC091ME-V02	B. Pudell
Reason			
<ul style="list-style-type: none">– Serial numbers added– Editorial corrections			

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1 Equipment (Test item) Description

Description	The device PP120 is a pump providing irrigation and suction function for laparoscopy
Model	PP120
Additional Model(s)	None
Brand Name(s)	LAP-Pump
Serial number	1504PT0001
Hardware version	04/15
Software / Firmware version	01.01
PMN	TS-HW42
HVIN	1430
FVIN	-/-
HMN	PP120
Contains FCC-ID	2AS5K-TSHW42
Contains IC	25004-TSHW42A
Equipment type	End product

1.1 Standalone Radiation Sources

Mode #	Description	
RFID	Frequency range [MHz]	13.5609
	Channel spacing	N/A
	Modulations	ASK
	Maximum electric field [V/m @ 20cm]	1.26
	Maximum magnetic field [A/m @ 20cm]	0.011

1.2 Multi-transmitter Modes

None

1.3 Test Equipment Used

Field Strength Measurement					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Anechoic chamber	Frankonia	AC 2	EF00198	-	-
Broadband Field Meter NBM-550	Narda Safety Test Solutions	2401/01B	EF00998	2018-08	2019-08
Magnetic field probe HF3061	Narda Safety Test Solutions	2402/05B	EF00999	2018-08	2019-08
EM Radiation Monitor	Narda Safety Test Solutions	EMR-02	EF00058	2018-08	2019-08

2 Result Summary

FCC 47 CFR Part 2.1091, ISED RSS-102			
Product Specific Standard Section	Requirement	Result	Remarks
FCC 47 CFR 2.1091	Maximum permissible exposure @ 20cm below limit	PASS	
ISED RSS-102	Maximum permissible exposure @ 20cm below limit	PASS	
Remarks:			

3 Radiated Field Measurement

3.1 Test Conditions and Results – Electric and magnetic field strength

ELECTRIC AND MAGNETIC FIELD STRENGTH									
Test frequency range		Tested frequencies							
		F_{MID}							
EUT test mode		RFID							
Measurement method		radiated only							
Test procedure									
<ol style="list-style-type: none">1. EUT transmitter is activated in test mode under normal conditions2. The perimeter of the EUT is scanned with an electric and magnetic field probe at a fixed distance3. The electric and magnetic field strength is measured4. The maximum field strength values are recorded									
Test results									
Channel	Frequency [MHz]	Mode	Distance [m]	Max. electric field strength [V/m]	Max. magnetic field strength [A/m]				
F_{MID}	13.5609	Transmit	0.2*	1.26	0.011				
Comments: * from probe centre									

4 RF-Exposure Classifications

Device Types	
Fixed	A fixed device is defined as a device physically secured at one fixed location and cannot be easily re-located.
Mobile	A mobile device is defined as a transmitting device designed to be used in other than fixed locations and to generally be used in such a way that a separation distance of at least 20 centimeters is normally maintained between the transmitter's radiating structure(s) and the body of the user or nearby persons. (47 CFR 2.1091)
Portable	A portable device is defined as a transmitting device designed to be used so that the radiating structure(s) of the device is/are within 20 centimeters of the body of the user. (47 CFR 2.1093)
Exposure Categories	
Occupational / Controlled	Limits apply in situations in which persons are exposed as a consequence of their employment provided those persons are fully aware of the potential for exposure and can exercise control over their exposure. Limits for occupational/controlled exposure also apply in situations when an individual is transient through a location where occupational/controlled limits apply provided he or she is made aware of the potential for exposure.
General population / uncontrolled	Exposures apply in situations in which the general public may be exposed, or in which persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or cannot exercise control over their exposure.

5 Evaluation

5.1 MPE Evaluation Conditions – FCC 47 CFR 2.1091 / ISED RSS-102

MPE EVALUATION ACC. TO FCC 47 CFR 2.1091 / ISED RSS-102		VERDICT: PASS		
Assessment according to reference		Reference Method		
		FCC KDB 447498 D01 / ISED RSS-102		
Device type		mobile		
Exposure category		General public		
ISED Limits – Occupational / Controlled Exposure				
Frequency range [MHz]	Electric field strength [V/m]	Magnetic field strength [A/m]	Power density [W/m ²]	Averaging time [min]
0.003-10*	170	180	-	Instantaneous*
0.1-10	-	1.6 / f	-	6**
1.29-10	193 / $f^{0.5}$	-	-	6**
10-20	61.4	0.163	-10	6
20-48	129.8 / $f^{0.25}$	0.3444 / $f^{0.25}$	44.72 / $f^{0.5}$	6
48-100	49.33	0.1309	6.455	6
100-6000	15.60 $f^{0.25}$	0.04138 $f^{0.25}$	0.6455 $f^{0.5}$	6
6000-15000	137	0.364	50	6
15000-150000	137	0.364	50	616000 / $f^{1.2}$
150000-300000	0.354 $f^{0.5}$	$9.40 \times 10^{-4} f^{0.5}$	$3.33 \times 10^{-4} f$	616000 / $f^{1.2}$
ISED Limits – General Population / Uncontrolled Exposure				
Frequency range [MHz]	Electric field strength [V/m]	Magnetic field strength [A/m]	Power density [W/m ²]	Averaging time [min]
0.003-10*	83	90	-	Instantaneous*
0.1-10	-	0.73 / f	-	6**
1.1-10	87 / $f^{0.5}$	-	-	6**
10-20	27.46	0.0728	2	6
20-48	58.07 / $f^{0.25}$	0.1540 / $f^{0.25}$	8.944 / $f^{0.5}$	6
48-300	22.06	0.05852	1.291	6
300-6000	3.142 $f^{0.3417}$	0.008335 $f^{0.3417}$	0.02619 $f^{0.6834}$	6
6000-15000	61.4	0.163	10	6
15000-150000	61.4	0.163	10	616000 / $f^{1.2}$
150000-300000	0.158 $f^{0.5}$	$4.21 \times 10^{-4} f^{0.5}$	$6.67 \times 10^{-5} f$	616000 / $f^{1.2}$
* = Based on nerve stimulation				
** = Bases on specific absorption rate				

FCC Limits – Occupational / Controlled Exposure				
Frequency range [MHz]	Electric field strength [V/m]	Magnetic field strength [A/m]	Power density [mW/cm ²]	Averaging time [min]
0.3 – 3.0	614	1.63	(100)*	6
3.0 - 30	1842 / f	4.89 / f	(900 / f ²)*	6
30 - 300	61.4	0.163	1.0	6
300 - 1500	N/A	N/A	f / 300	6
1500 - 100000	N/A	N/A	5.0	6
FCC Limits – General Population / Uncontrolled Exposure				
Frequency range [MHz]	Electric field strength [V/m]	Magnetic field strength [A/m]	Power density [mW/cm ²]	Averaging time [min]
0.3 – 1.34	614	1.63	(100)*	30
1.34 - 30	842 / f	2.19 / f	(180 / f ²)*	30
30 - 300	27.5	0.073	0.2	30
300 - 1500	N/A	N/A	f / 1500	30
1500 - 100000	N/A	N/A	1.0	30

* = Plane wave equivalent power density; f in MHz

Assessment procedure
The evaluation is performed at a separation distance of 20 cm. The reference levels are taken from 47 CRF 1.1310 for FCC and RSS-102 for ISED according to the exposure category declared by customer.

For each radio and frequency band the worst case transmission mode with the highest output power is activated and the surrounding area around the EUT is scanned using an electric and a magnetic field probe at the distance given in the test report. The maximum electric and magnetic field strength values measured are compared to the corresponding reference levels. If both measured field strength values are below the reference levels the EUT has passed the RF-Exposure requirements.

5.2 Single-Transmitter Evaluation – FCC 47 CFR 2.1091 / ISED RSS-102

Assessment results – RFID				
Transmission mode				
Operating mode frequency range [MHz]	13.5609			
Assessment frequency (f) [MHz]	13.5609			
Compliance separation distance to EUT [m]	0.2			
Electric Field				
Measured max. electric field strength [V/m]	1.26			
Reference level [V/m]	62.09 (FCC)	27.46 (ISED)		
Verdict	PASS			
Magnetic Field				
Measured max. magnetic field strength [A/m]	0.011			
Reference level [A/m]	0.162 (FCC)	0.0728 (ISED)		
Verdict	PASS			
Verdict				
The field strength level of the EUT are below the RF-Exposure reference level at the given compliance separation distance!				
Comments:				